

Figure 1. Nucleotide and predicted amino acid sequence of CLASP-2A cDNA (SEQ ID NOS:1 and 2). Notable protein motifs are indicated above the nucleotide sequence in bold. Potential initiator methionines are underscored. The notable, predicted protein motifs are: a cadherin cleavage site encoded by nucleotides 854-868, a cadherin ectodomain (EC) encoded by nucleotides 1253-1264, a transmembrane domain encoded by nucleotides 2861-2917, a coiled coil domain encoded by nucleotides 3579-3682, a second coiled coil domain encoded by nucleotides 3827-3937, and a PDZ binding motif (PBM) encoded by nucleotides 4046-4057.

Please replace the paragraph beginning at page 6, line 18, with the following rewritten paragraph:

Figure 2. A. Schematic of CLASP-2 splice variants. Splice variants are compared to Human (h) CLASP-2A. Numbers above hCLASP-2A line diagram indicate where splice variations comprising deletions and insertions relative to hCLASP-2A are found. Abbreviations: "KIAA" KIAA1058 sequence (Genbank Accession No. AB028981). **B.** Nucleotide and predicted amino acid sequence of CLASP-2A cDNA (SEQ ID NOS:1 and 2). Notable protein motifs are indicated above the nucleotide sequence in bold. Exact position of insertions and deletions are indicated above the CLASP-2A sequence with arrows and "x", respectively. The nucleotide sequence of insertions schematized in FIG. 2A are indicated above the arrow. The insertions and deletions are as follows (numeration refers to Human CLASP-2A nucleotide sequence): Nucleotides 1966-2034 are deleted in CLASP-2D. Nucleotides 2219-2224 are deleted in CLASP-2B. There is an insertion of 69 nucleotides at nucleotide 2927 found in CLASP-2D. The nucleotide sequence for this insertion is: AAGCAGTCCAGTGGGAGCCGCCCTTCTCCCCACAGCCATAGCGCCTGCCTGAG GAGGAGCCGGGGAG (SEQ ID NO:11) and encodes amino acids AVQWEPPLLPHSHSACLRRSRG (SEQ ID NO:12) (one letter amino acid abbreviation). This amino acid sequence encodes a putative SH3 binding domain. There is another deletion at between nucleotides 3011-3079 found in CLASP-2E. CLASPs 2B, 2C, 2D and 2E contain an insertion at nucleotide 3153 with the nucleotide sequence of: TGAGAGGCTGGCCCATCTGTATGACACGCTGCACCGGGCCTACAGCAAAGTGA CCGAGGTCATGCACTCGGGCCGAGGCTTCTGGGGACCTACTTCCGGGTAGCCTT

CTTCGGGCAGGCAGCGCAATACCAGTTTACAGACAGTGAAACAGATGTGGAGGG
ATT (SEQ ID NO:13). The entire sequence is found in CLASP-2D and encodes amino acids
ERLAHLYDTLHRAYSKVTEVMHSGRLLGTYFRVAFFGQAAQYQFTDSETDVEG
(SEQ ID NO:14) while the underline sequence is found in CLASPs 2B, 2C, and 2E and
encodes amino acids ERLAHL^{a3}YDTLHRAYSKVTEVMHSGRLLGTYFRVAFFGQG
correl. (SEQ ID NO:15). This amino acid sequence encodes a putative immunoreceptor tyrosine-
based activation motif (ITAM). There is a two nucleotide deletion in Human CLASP-2C
found at nucleotides 3586 and 3587. There is an insertion of 8 nucleotides found only in
Human CLASP-2D with sequence: CTGGGATG at nucleotide 3937. This insertion puts a
stop codon into the CLASP-2D nucleotide sequence.

Please replace the paragraph beginning at page 7, line 16, with the following
rewritten paragraph:

^{a4} **Figure 3. A.** Alignment of nucleotide sequences of the CLASP-2 isoforms
(SEQ ID NOS:1, 3 5, 7, 9, 16, and 18). Sequences were aligned using ClustalW **B.**
Alignment of amino acid sequence of the CLASP-2 isoforms(SEQ ID NOS:2, 4, 6, 8, 10, 17,
and 19). Sequences were aligned using ClustalW. One letter amino acid abbreviation is used.

Please replace the paragraph beginning at page 8, line 3, with the following
rewritten paragraph:

^{a5} **Figure 5. A.** Amino acid sequence of human and rat CLASP proteins.
Sequences were aligned using ClustalW. One letter amino acid abbreviation used. Protein
motifs are found within the labeled boxes. A “-” indicates gaps that are placed to acquire a
best overall alignment. Other abbreviations: “HC2A” Human CLASP-2 sequence (SEQ ID
NO:2), “KIAA” KIAA1058 sequence (SEQ ID NO:7) (Genbank Accession No. AB028981),
“rat” TRG gene (SEQ ID NO:20) (Genbank Accession No. X68101), “HC4” Human
CLASP-4 sequence (SEQ ID NO:21), “HC1” Human CLASP-1 sequence (SEQ ID NO:22),
“HC3” Human CLASP-3 sequence (SEQ ID NO:23), “HC5” Human CLASP-5 sequence
(SEQ ID NO:24). **B.** Alignment of DOCK motifs found within the human CLASPs and
compared to canonical DOCK motifs. Consensus amino acids found within all DOCK motifs

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cord. are also indicated. Motifs A and B = SEQ ID NOS:25-34; motif C = SEQ ID NOS:35-43;
motifs D and E = SEQ ID NOS:44-55; motifs F and G = SEQ ID NOS:56-67.

Please replace the paragraph beginning at page 8, line 12, with the following rewritten paragraph:

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Figure 6. A. Nucleotide (SEQ ID NO:1) and predicted amino acid (SEQ ID NO:2) sequence of CLASP-2A cDNA. Notable protein motifs are indicated (see FIG. 1 legend for details). Additionally, boundaries between exons and introns are indicated by arrows. These boundaries were defined by sequencing Bacterial Artificial Chromosomes (BACs) containing genomic DNA corresponding to CLASP-2 (SEQ ID NOS:68-85). BACs were sequenced using primers derived from exon sequences corresponding to the CLASP-2 cDNA. Each exon/intron boundary is noted (as "Ref" with an appropriate reference number) above the cDNA sequence. The references contain exact nucleotide location of introns. The names and nucleotide numbers of the primers that were used in sequence reactions are also indicated. All nucleotide numbers refer to CLASP-2A cDNA sequence. As shown in the reference, not all of the sequence from sequencing reactions produced sequence matching the cDNA. These nucleotide sequences that did not match the exon sequence for CLASP-2 were considered to be intron sequences. **B.** Alignment of human (SEQ ID NOS:2, 8, and 21-24) and rat (SEQ ID NO:20) CLASP amino acid sequences by ClustalW. Notable protein motifs are indicated (see FIG. 1 Legend for additional details). Additionally, the exon/intron borders described in part A are indicated with vertical lines between appropriate amino acids. Reference numbers are indicted in the right margin and correspond to references in Fig 6A and B.

Please replace the paragraph beginning at page 9, line 17, with the following rewritten paragraph:

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Figure 9. A. Binding of CLASP-2 C-terminal 20 amino acids to PDZ domains. 20 μ M biotinylated synthetic peptide corresponding to the C-terminal 20 amino acids of CLASP-2 was reacted with the indicated plate bound GST fusion proteins (none = no GST fusion protein coated onto plate). Error bars indicate standard deviation of duplicate

measurements. **B.** Affinity of CLASP 2 – PDZ interactions. Varying concentrations of biotinylated CLASP-2 peptide were reacted with plate bound GST alone, GST-DLG1, GST-NeDLG, and GST-PSD95 fusion proteins. The binding to GST alone (< 0.1 OD units) was subtracted from the binding to the fusion proteins and the remaining signal was divided by the signal observed upon addition of $30\ \mu\text{M}$ CLASP-2 peptide to each PDZ domain-containing protein ($0.4 - 1.0$ OD units) and plotted. The plotted data was fit to a saturation binding curve, yielding an apparent affinity of $7.5\ \mu\text{M}$ for NeDLG- CLASP-2 interaction, $21\ \mu\text{M}$ for DLG1- CLASP-2 interaction, and $45\ \mu\text{M}$ for PSD95-CLASP-2 interaction. Data are means of duplicate data points, with standard errors between duplicate data points $< 10\%$. **C.** Inhibition of CLASP-2 – PDZ binding. $5\ \mu\text{M}$ biotinylated synthetic peptide corresponding to the C-terminal 20 amino acids of CLASP-2 was reacted with the indicated, plate-bound PDZ domain-containing GST fusion proteins in the presence or absence of $100\ \mu\text{M}$ competitor peptide. CLASP-2 Inhibitor refers to a synthetic peptide composed of the eight C-terminal amino acids of CLASP-2. KV1.3 Inhibitor refers to a synthetic peptide composed of the 19 C-terminal amino acids of KV1.3, a lymphocyte potassium channel. The amino acid sequence of the KV1.3 inhibitor is TTNNNPNSAVNIKKIFTDV (SEQ ID NO:86). **D.** Inhibition of KV1.3 – PDZ binding. $5\ \mu\text{M}$ biotinylated synthetic peptide corresponding to the C-terminal 19 amino acids of KV1.3 was reacted with the indicated, plate-bound PDZ-domain containing GST fusion proteins in the presence or absence of $100\ \mu\text{M}$ CLASP-2 Inhibitor (see FIG. 9C legend).

Please replace the paragraph beginning at page 10, line 9, with the following rewritten paragraph:

Figure 10. Preliminary nucleotide (SEQ ID NO:87) and predicted amino acid (SEQ ID NO:88) sequences of CLASP-2 cDNA.

Please replace the paragraph beginning at page 10, line 10, with the following rewritten paragraph:

Figure 11. A) Full length cDNA sequence (SEQ ID NO:118) and predicted amino acid translation (SEQ ID NO:119) of the human CLASP-2 gene. Predicted initiator

methionine starts at nucleotide +1. Three independent 1st exons (indicated as 1A (SEQ ID NO:115), 1B (SEQ ID NO:116), and 1C (SEQ ID NO:117)) splice into the second exon starting at nucleotide -101. The sequence appearing in FIG. 1 corresponds to nucleotides 1884 through 6690 of FIG 11A. **B**) Differences between the human CLASP-2 cDNA isoforms. In addition to the differential first exon usage indicated in **A**, sequencing multiple, independent cDNA products revealed nucleotide polymorphisms (allelic variations) between CLASP-2 cDNA isoforms. Additionally, differential exon usage through alternative splicing events was discovered. The use of the exon in **B** leads to a premature stop codon that can generate a soluble form of CLASP-2. **C**. Schematic of human CLASP-2 cDNAs. The top line represents nucleotide numbering found in FIG. 11A. Line (i) represents CLASP-2 cDNA shown in FIG. 1 above; line (ii) represents the full length CLASP-2 isoforms, where there are three CLASP-2 full length cDNA isoforms (A + Z, B + Z, and C + Z). Each of the isoforms uses a unique first exon (A, B, and C) (*see* FIG. 11A) that splices into the rest of the cDNA from exon 2 onwards represented by Z. The portion of the cDNA represented by Z itself has alternative splice and nucleotide polymorphisms that are shown in FIG. 2 above. Line (iii) represents the additional 5' sequence with a small region of overlap between nucleotides 1884 to 2109 in FIG. 11A and nucleotides 1-225 of FIG. 1.

Please replace the paragraph beginning at page 10, line 28, with the following rewritten paragraph:

Figure 12. Sequence of human CLASP-2 exons and intron boundaries. **A** Sequence of human CLASP-2 exons and intron borders (SEQ ID NOS:120-133). Stretches of noncontiguous genomic sequence from the Human Genome Project (GENBANK entry gi9988160) were aligned using the human CLASP-2 cDNA as a template and Sequencher sequence analysis software (Gene Codes Corp). 22 exons representing approximately the 5' 20% of the human CLASP-2 cDNA sequence are presented in predicted 5' to 3' order. Exon sequences are underlined and are flanked by intron sequence. Nucleotide numbers in parentheses refer to the exon sequence within the uniquely-generated, contiguous gi9988160 sequence, which is located in **B**. **B**. Ordered stretch of human genomic DNA at the CLASP-2 locus aligned from noncontiguous, shotgun sequencing from the Human Genome Project

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and. using the human CLASP-2 sequence from FIG. 5A to determine genomic DNA fragment order and orientation.

Please replace the paragraph beginning at page 11, line 8, with the following rewritten paragraph:

Q¹¹ **Figure 13.** Amino acid alignment and comparison between the human (h) CLASP family members (SEQ ID NOS:135, 136, 137, 119, 138 and 139). Amino acid sequences were aligned using ClustalW. The alignment is presented in order of their greatest pairwise similarity scores. Single letter amino acid abbreviations are used. Asterisks indicate complete identity, while colons and periods indicate sequence similarity among CLASP family members. Dashes indicate gaps inserted in the amino acid sequence to facilitate alignment. Labeled boxes are domains with similarity to known protein motifs; unlabelled boxes represent regions of similarity between all CLASPs and may represent CLASP-specific domains.

Please replace the paragraph beginning at page 22, line 11, with the following rewritten paragraph:

Q¹² The CLASP-2 protein is type I transmembrane glycoprotein, characterized by multiple forms produced by alternative exon usage (*i.e.*, production of splice variants). In one naturally occurring form, CLASP-2 has the structure shown in FIG. 1. However, as discussed in detail *infra*, the CLASP-2 gene encodes a variety of gene product due to alternative splicing of mRNA. FIG. 2 shows the nucleotide sequence and conceptual translation of human CLASP-2 polypeptides. FIGS. 3A and 3B show alignment of the CLASP-2A through 2E nucleotide and amino acid sequences, respectively:

hCLASP-2A cDNA (SEQ ID NO:1) and hCLASP-2A polypeptide (SEQ ID NO:2).
hCLASP-2B cDNA (SEQ ID NO:3) and hCLASP-2B polypeptide (SEQ ID NO:4).
hCLASP-2C cDNA (SEQ ID NO:5) and hCLASP-2C polypeptide (SEQ ID NO:6).
hCLASP-2D cDNA (SEQ ID NO:7) and hCLASP-2D polypeptide (SEQ ID NO:8).

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hCLASP-2E cDNA (SEQ ID NO:9) and hCLASP-2E polypeptide (SEQ ID NO:10).

Please replace the paragraph beginning at page 24, line 10, with the following rewritten paragraph:

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The CLASP-2 extracellular domain is characterized by one cadherin EC-like motif (Pigott, R. and Power, C., 1993, *The Adhesion Molecule Factbook*. Academic Press, pg. 6; Jackson, R. M. and Russell, R. B., 2000, *J. Mol. Biol.* 296: 325-34). Several highly conserved cysteines are found in the extracellular domain, as well as various glycosylation signals. Through its extracellular domains, CLASP-2 may interact with ligands in a homotypic and/or heterotypic manner to establish the immunological synapse in conjunction with molecules such as TCR, MHC class I, MHC class II, CD3 complex and accessory molecules such as CD4, CD3, ICAM-1, LFA-1, and others. Many cadherins contain a pro-domain of approximately 50 to 150 amino acids that is removed before localization to the plasma membrane. This cleavage is presumed to be carried out by Furin (Posthaus, H. *ET al.*, 1998, *FEBS Let* 438: 306-10) at a consensus sequence of RKQR (SEQ ID NO:89). Furin is a protease that is at least partially responsible for the maturation of certain cadherins. CLASP-2 has the sequence RNQR (SEQ ID NO:90) at nucleotides 945 through 957. By homology, this region is around 120 amino acids into the predicted protein start site for hCLASP-2A. This region may be a pro-domain and cleavage may be required for CLASP-2 function, or aspects of CLASP-2 function.

Please replace the paragraph beginning at page 27, line 7, with the following rewritten paragraph:

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CLASP-2 polypeptides contain a new "DOCK" motif, not previously described in the scientific literature. The CLASP DOCK motif includes a series of five tyrosines surrounded by conserved sequences in regions A, B, C, D, and G (see FIG. 5B). There are also two highly conserved non-tyrosine containing regions E (P+EXAI+XM; SEQ ID NO:91) and G (LXMXL+GXVXXXVNXG; SEQ ID NO:92) (where X is any amino acid) separated by 20 amino acids.

Please replace the paragraph beginning at page 38, line 27, with the following rewritten paragraph:

For example, CLASP-2A and CLASP-2C are related to each other as apparent splice variants, with CLASP-2C containing an exon not found in CLASP-2A. The exon sequence is 5'-AGG GAT TTT GAG AGG CTG GCC CAT CTG TAT GAC ACG CTG CAC CGG GCC TAC AGC AAA GTG ACC GAG GTC ATG CAC TCG GGC CGC AGT TNC TGG GGA CCT ACT TCC GGG TAG CCT TCT TCG GGC AG-3' (SEQ ID NO:93) (encoding the peptide sequence:RDFERLAHLYDTLHRAYSKVTEVMHSGRLLGTYFRVAFFGQGF (SEQ ID NO:94)). It will be apparent to one of skill that, by using polynucleotide probes or primers corresponding to the nucleic acid sequence above, or by using antibodies that specifically recognize the peptide above, or those polynucleotide probes or primers shown in Table 3 below, it is possible to distinguish between different CLASP isoforms(e.g., to detect differential expression).

Please replace Table 3 on page 39 with the following amended table:

Table 3

	Found in/will detect	Exemplary Probe/Primer (5' - 3')	SEQ ID NO	Notes/Comments
1	full length hC2A	F1: CCCAGATTTTATGATGAG R1: GATAATGACAAAGTTCTGAC	95 96	
2	full length hC2D	F2: CTGGAAATCTTGACAAAAATGC R2: GTCTTTTAAATACAGATGTGG	97 98	
3	hC2B, hC2C, hC2E	F3: GAGAGGCTGGCCCATCTGTATG R3: ATCTTCAAAGAATCCCTGCC	99 100	Distinction based upon product size differences following PCR
4	hC2D	F4: GAAGCAGTCCAGTGGGAGCCG R4: GCCTCCCCGGCTCCTCCTCAGG	101 102	Recognizes hC2D-specific insertion
5	hC2D	F3: GAGAGGCTGGCCCATCTGTATG R5: CCTCCACATCTGTTCACTGTC	99 103	
6	hC2E	F5: CTCCATGATGGAAGACGTGGG R6: GATGAGCTCGTAGCGCTCGGC	104 105	Spans deletion unique to hC2E. Distinction based upon product size differences following PCR
7	hC2B	F6: CATTGGCGTTTAAAGCTCCTG R3: ATCTTCAAAGAATCCCTGCC	106 100	F6 primer spans deletion unique to hC2E
8	hC2A	F7: GGACCCATAGTTCATGATCG R4: TTTCATCTTCAAGAAATCCCTC	107 108	R4 primer spans the region where other CLASPs have an insert

Please replace the paragraph beginning at page 42, line 20, with the following rewritten paragraph:

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Exemplary CLASP-2 polynucleotide fragments are preferably at least about 15 nucleotides, and more preferably at least about 20 nucleotides, still more preferably at least about 30 nucleotides, and even more preferably, at least about 40 nucleotides in length, or larger 50, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650 nucleotides. In one embodiment, exemplary fragments include fragments having at least a sequence from about nucleotide number 1-50, 51-100, 101-150, 151-200, 201-250, 251-300, 301-350, 351-400, 401-450, 451-500, 501-550, 551-600 to the end of SEQ ID NO:1 or SEQ ID NO:3 or comprising the cDNA coding sequence in the deposited clones. In this context "about" includes the particularly recited ranges, larger or smaller by several (5, 4, 3, 2, or 1) nucleotides, at either terminus or at both termini. Preferably, these fragments encode a polypeptide which has biological activity. More preferably, these polynucleotides can be used as probes or primers as discussed herein.

Please replace the paragraph beginning at page 43, line 20, with the following rewritten paragraph:

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In one embodiment, the CLASP-2 variants differ from those shown in FIG. 1 or FIG. 11 (SEQ ID NOS:1, 2, 115, 116, 117, 118, and 119) by virtue of incorporating a different combination of exons than found in the exemplified sequences. For example, 81g01 (Genbank Accession Number AF85864; Locus HUMYN81g01; 526 bp; EST sequence submitted August 29, 1998 by Washington University at St. Louis; see FIG. 3A and FIG. 3B) is a variant of hCLASP-2 on the basis of CLASP-2 identity along certain stretches of the sequence. From 5' to 3', it begins with a 315 nucleotide stretch which is identical to CLASP-2A. It then has a gap relative to CLASP-2A that is identical to the GAP in another CLASP-2 isoform, hCLASP-2D (KIAA1058). In place of that gap, a 16 amino acid insert (48 nucleotides) is present which is not found in other isoforms, followed by another approximately 150 bp stretch of nucleotides once again identical to CLASP-2A. This is characteristic of an alternate splice due to the specific sequence identity on both sides of a differential stretch of nucleotides.

Please replace the paragraph beginning at page 45, line 3, with the following rewritten paragraph:

q¹⁹ In various embodiments, CLASP-2 polynucleotide fragments include coding regions for, or regions hybridizable to, the CLASP-2 structural or functional domains described *supra*. As set out in the Figures, such preferred regions include the following domains/motifs: ITAM, DOCK, COILED/COILED, and PBM. Thus, for example, polypeptide fragments of CLASP-2 as shown in FIG. 1 and FIG. 11 (SEQ ID NO:1, 2, 115, 116, 117, 118, and 119) falling within conserved domains are specifically contemplated by the present invention (see FIG. 3). Moreover, polynucleotide fragments encoding these domains are also contemplated. Such polypeptide fragments find use, for example, as inhibitors of CLASP-2 function in CLASP-2-expressing cells.

Please replace the paragraph beginning on page 57, line 13, with the following amended paragraph:

q²⁰ In one embodiment, the antisense sequence is complementary to relatively accessible sequences of the CLASP-2 mRNA (*e.g.*, relatively devoid of secondary structure). This can be determined by analyzing predicted RNA secondary structures using, for example, the MFOLD program (Genetics Computer Group, Madison WI) and testing in vitro or in vivo as is known in the art. Another useful method for identifying effective antisense compositions uses combinatorial arrays of oligonucleotides (see, *e.g.*, Milner *et al.*, 1997, Nature Biotechnology 15: 537). Examples of oligonucleotides that can be tested in cells for antisense suppression of CLASP-2 function are those capable of hybridizing to (*i.e.*, substantially complementary to) the following positions from SEQ ID NO:1:

- 1) GAAGGCGATCATCACGTGGCCTTCCATCGC
(SEQ ID NO:109)
- 2) GCTTCAAGTAATGACTGGTGCAGAACATCTG
(SEQ ID NO:110)
- 3) GCTCCTCCTCAGGCAGGCGCTATGGCTGTGG
(SEQ ID NO:111)
- 4) GTAGGCCCGGTGCAGCGTGTTCATACAGATGG

(SEQ ID NO:112)

(See also Example 7B, Table 5)

Please replace the paragraph beginning on page 58, line 4, with the following amended paragraph:

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The antisense nucleic acids (DNA, RNA, modified, analogues, and the like) can be made using any suitable method for producing a nucleic acid, such as the chemical synthesis and recombinant methods disclosed herein. In one embodiment, for example, antisense RNA molecules of the invention can be prepared by *de novo* chemical synthesis or by cloning. For example, an antisense RNA that hybridizes to CLASP-2 mRNA can be made by inserting (ligating) an CLASP-2 DNA sequence (*e.g.*, SEQ ID No:1, or fragment thereof) in reverse orientation operably linked to a promoter in a vector (*e.g.*, plasmid). Provided that the promoter and, preferably termination and polyadenylation signals, are properly positioned, the strand of the inserted sequence corresponding to the noncoding strand will be transcribed and act as an antisense oligonucleotide of the invention. The term "operably linked" refers to a functional linkage between a nucleic acid expression control sequence (such as a promoter or enhancer) and a second nucleic acid sequence, wherein the expression control sequence directs transcription of the nucleic acid corresponding to the second sequence.

Please replace the paragraph beginning on page 109, line 6, with the following amended paragraph:

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The following cDNA clones described in the Specification and further described in the Examples below have been deposited with the American Type Culture Collection, 10801 University Boulevard, Manassas, VA 20110-2209 under the Budapest Treaty on October 17, 2000 and given the Accession Nos. indicated:

hCLASP-2 clone hC2GR3.3 (AVC-PD14) ATCC Accession No. PTA-2611
hCLASP-2 clone hC2RT (AVC-PD19) ATCC Accession No. PTA-2614

Please replace the Primer Table, on page 112, with the following amended table:

Primer Table

CLASP gene	Sense Primer	Sense sequence (SEQ ID NO:)	Antisense Primer	Antisense sequence
CLASP-7	HC7gS5	AGGCCTTGCTCTGTTACCTG SEQ ID NO:140	HC7gAS1	TGTCATGTACTGCACTCGCACAGC SEQ ID NO:146
CLASP-7	HC7gS3	ACAGGAACCTGCTGTACGTGTAC SEQ ID NO:141	HC7AS14	TCGTGGCTGCACAGGATGCGGGTG SEQ ID NO:147
CLASP-4	C4P2	GACCCATTAGGAGGTCTAC SEQ ID NO:142	HC4AS3'	CGGGATCCATTGTACACGTACATCT GC SEQ ID NO:148
CLASP-4	C4P2	GACCCATTAGGAGGTCTAC SEQ ID NO:143	HC4AS3'	CGGGATCCATTGTACACGTACATCT GC SEQ ID NO:149
CLASP-1	hC1S5'	TATGTCTCAGTCACCTACCTG SEQ ID NO:144	HC1AS3'Kpn	CTTGGTACCACTTCAGCACTAGATG AGATG SEQ ID NO:150
CLASP-1	C1S7	TCAAGACCAGGGCATGCAAG SEQ ID NO:145	HC1AS3'Kpn	CTTGGTACCACTTCAGCACTAGATG AGATG SEQ ID NO:151

Please delete the paragraph beginning on page 112, line 7, and insert in it's place the following table:

Primer	Sequence (5' to 3')	SEQ ID NO:	Nucleotide Position
HC2RACE1	AAGAGCAGCATCTCCCGTAAACAGTC	152	-15 to 11
HC2RACE2	TAACAAGCTCTGTGCTTCTCTCCG	153	414 to 443
HC2RACE3	ACCACTTTGTTTCGGAAGCTGTCGAAACT C	154	512 to 540
HC2RACE4	TTTGTACAGCCAGCCATGCTTGGTGATC	155	634 to 661

Please replace Table 5, on page 119, with the following amended table:

Table 5

Oligo	Sequence 5'-3' (SEQ ID NO:)	length	notes/comments
1	GAAGGCGATCATCACGT GGCCTTCCATCGC (SEQ ID NO:109)	30-mer	encompasses nucleotides 473-502 and spans the putative initiator methionine (underlined). The function of HC2A, 2B, 2C, and 2E isoforms can be eliminated by this oligonucleotide.
2	GCTTCAAGTAATGACTGG TGCAGAACATCTG (SEQ ID NO:110)	31-mer	Oligonucleotide that should recognize HC2A, 2B, 2D, 2E, and 2F. Encompasses nucleotides 2121-2151. Can be eliminate function of these CLASP-2 isoforms.
3	GCTCCTCCTCAGGCAGGC GCTATGGCTGTGG	34-mer	oligonucleotide specific for HC2C based upon a specific exon found at nucleotide 2927. Can eliminate only HC2D function.